In TransCAD, click the ***Network/Paths*** drop down menu then click ***Multiple Paths***. TransCAD will prompt the user for the network file and to select the endpoints representing the TAZ's. The output is an impedance matrix for each pair of zones based on travel time.

Developing Friction Factors

Friction factors are a required input in the gravity model. Friction factors are inversely proportional to impedance.

The equation is as follows:
f(cij) = a(cij)^-b * e^-c(cij), where a>0, c>= 0

The gamma function requires user specification of the parameters to be used in the model. Travel Estimation Techniques for Urban Planning (NCHRP365, 1995) suggests that the gamma function be used with the following parameters (Table 1):

Table 1: Recommended Gamma Function Parameters

Trip Purpose	A	b	C
HBW	28507	0.02	0.123
HBO	139173	1.285	0.094
NHB	219113	1.332	0.01

To create friction factors in TransCAD click ***Planning*** from the drop down menu. Select ***Trip Distribution*** then select ***Synthetic Friction Factors***. TransCAD opens the friction factor matrix dialogue box. In this box the user specifies the impedance function (gamma function), and types in the function parameters to be used for each trip purpose. The user must also specify the file location of the impedance matrix created and discussed in the above section. The TransCAD output is a set of friction factor matrices for each trip purpose specified.

Applying the Gravity Model

Applying the gravity model in TransCAD is a simple procedure. The TAZ geographic file must be the active window in TransCAD. Choose ***Planning*** from the drop down menu, select ***Trip Distribution***, then select ***Gravity Evaluation***. TransCAD displays the gravity evaluation dialogue box. The user specifies the file containing the productions and attractions (the TAZ geographic file) and the location of the friction factor matrices for each trip purpose. TransCAD generates P-A (production-attraction) flow matrices for each trip purpose. The trip purpose matrices are then summed to create a total P-A flow matrix of all trip purposes. To sum matrices in TransCAD, choose ***Matrix*** from the drop down menu and click ***Quick Sum***.